United States
Environmental Protection Agency

Office of
Ground Water and
Drinking Water

CLASS V UIC STUDY FACT SHEET
SPENT BRINE RETURN FLOW WELLS

What is a spent brine return flow well?	Spent brine return flow wells are used to dispose of brines from which minerals, halogens, and other compounds have been extracted. These wells are commonly associated with manufacturing facilities that produce specialty chemicals such as boron, bromine, magnesia, or their derivatives.
What types of fluids are injected into spent brine return flow wells?	The chemical characteristics of the injected spent brine are determined primarily by the characteristics of the brine that is withdrawn for processing and the nature of the extraction and production processes used. In general, the chemical composition of the spent brine is similar to that of the produced brine except that the concentration of target elements (e.g., magnesium) has been reduced and the concentration of other elements (e.g., calcium) may have been increased through substitution.
Do injectate constituents exceed drinking water standards at the point of injection?	Available data indicate that concentrations of barium and boron in spent brine routinely exceed primary drinking water standards and health advisory levels in AR. Data available for MI facilities indicate that chloride, copper, iron, manganese, total dissolved solids, and pH levels frequently exceed secondary drinking water standards. Data are not available to determine whether concentrations of some other constituents, including some heavy metals, are present at concentrations above health-based levels.
What are the characteristics of the injection zone of a spent brine return flow well?	Spent brine return flow wells inject spent brine into the same formation from which it was withdrawn, which, in all current cases, is below the lowermost underground source of drinking water (USDW). (In fact, most spent brine return flow wells were initially drilled as production wells and subsequently converted to injection wells.)
Are there any contamination incidents associated with spent brine return flow wells?	No incidents of USDW contamination by spent brine return flow wells have been reported.
Are spent brine return flow wells vulnerable to spills or illicit discharges?	Spent brine return flow wells are not likely to receive accidental spills or illicit discharges.
How many spent brine return flow wells exist in the United States?	There are 98 documented spent brine return flow wells that are regulated as Class V injection wells. There are other spent brine return flow wells in the United States that are currently being regulated as Class II or III wells (in NY, TN, CA, and OK).
Where are spent brine return flow wells located within the United States?	Documented Class V spent brine return flow wells are located in AR (74) and MI (24).
How are spent brine return flow wells regulated in states with the largest number of this type of well?	*Individual permit*: AR, MI
Where can I obtain additional information on spent brine return flow wells?	For general information, contact the Safe Drinking Water Hotline, toll-free 800-426-4791. The Safe Drinking Water Hotline is open Monday through Friday, excluding federal holidays, from 9:00 a.m. to 5:30 p.m. Eastern Standard Time. For technical inquiries, contact Amber Moreen, Underground Injection Control Program, Office of Ground Water and Drinking Water (mail code 4606), EPA, 401 M Street, SW, Washington, D.C., 20460. Phone: 202-260-4891. E-mail: moreen.amber@epa.gov. The complete Class V UIC Study (EPA/816-R-99-014, September 1999), which includes a volume addressing spent brine return flow wells (Volume 9), can be found at http://www.epa.gov/OGWDW/uic/cl5study.html.